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EVALUATION OF 1963-64 SPRUCE BUDWORM POPULATIONS
IN OREGON AND WASHINGTON

By

Paul E. Buffam, Entomologist
Division of Timber Management
Insect and Disease Control Branch

INTRODUCTION

For the fifth consecutive year, spruce budworm egg populations were sampled and evaluated on forested lands in Oregon and Washington. Plots were sampled in northeastern Washington, northeastern Oregon, and south central Oregon in budworm-defoliated areas spotted during the 1963 cooperative aerial detection survey. Plots in south central Washington were also sampled to determine the effects of the cooperative control project in 1962 on 44,500 acres on the Glenwood District of the State of Washington Department of Natural Resources and Yakima Indian Reservation. For the third consecutive year, plots in northern California were sampled in cooperation with Region 5 Insect and Disease Control personnel. Results of the survey in northern California are not reported in this paper.

Results of the 1963 cooperative aerial detection survey in Oregon and Washington show that the area of spruce budworm-caused tree defoliation has increased since 1962. Data from the budworm egg mass survey indicate that the spruce budworm population and subsequent tree damage will be generally reduced in Washington and Oregon in 1964 from that present in 1963.

STATUS OF SPRUCE BUDWORM DEFOLIATION IN 1963

A summary of spruce budworm infestations tallied during the 1962 and 1963 regionwide cooperative aerial detection surveys is shown in Table 1.1/ 2/

1/ Orr, P.W. Forest Insect Conditions in the Pacific Northwest during 1962. U.S. Forest Service, Region 6. 47 pp. June 1963.

2/ Orr, P.W. Forest Insect Conditions in the Pacific Northwest during 1963. U.S. Forest Service, Region 6. (In process of publication.)

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The total forested acreage defoliated in 1963 was 22 percent more than that in 1962. In Oregon, acreage infested on the Wallowa-Whitman National Forest increased 90 percent while that on the Fremont National Forest decreased 12%. Four new infestation centers totaling 10,200 acres, were detected on the Kaniksu National Forest in northeastern Washington in 1963.

Table 1.--Area of spruce budworm infestations in Oregon and Washington in 1962 and 1963 by administrative unit.

Administrative Unit	Area infested by spruce budworm		
	1962	1963	Difference 1963-1962
- - - - - <u>Acres</u> - - - - -			
<u>Washington:</u>			
Kaniksu National Forest	0	10,200	+ 10,200
Washington areas	0	10,200	+ 10,200
<u>Oregon:</u>			
Wallowa-Whitman N.F.	6,310	12,000	+ 5,690
Fremont National Forest	42,060	37,040	- 5,020
Oregon areas	48,370	49,040	+ 670
Regional total	48,370	59,240	+ 10,870

Defoliation on spruce budworm-infested forests in the Region was light to moderate. Defoliation on the Fremont National Forest was light, while some moderate defoliation was detected on the Wallowa-Whitman and Kaniksu National Forests. No defoliation was observed on the Glenwood District or Yakima Indian Reservation.

1963 EGG MASS EVALUATION SURVEY

This year's egg mass evaluation survey began on August 19 and was concluded on October 4. Foliage from either Douglas-fir or white fir trees was collected at 23 permanent sample plots in Washington and Oregon and 5 in northern California and examined at Lakeview, Oregon, for the presence of spruce budworm egg masses. Two plots were established on the Kaniksu National Forest and one on the Fremont National Forest. All of the other plots sampled in 1963 were established during previous years' surveys. Foliage was collected this year from two plots on the Wallowa-Whitman National Forest that had not been sampled since 1959 and 1960 to determine if budworm populations were again approaching an epidemic level at

these two points. All seven plots at Simcoe Butte, Washington, were sampled in 1963 to help assess the results of the cooperative control project in the summer of 1962. No plots sampled during the last three years were discontinued.

Survey Methods

Methods and procedures used in sampling plots and examining foliage for the spruce budworm egg mass evaluation survey have been previously reported.^{3/}

For the fourth consecutive year, the spruce budworm egg mass evaluation survey was centered in Lakeview, Oregon. Plots were sampled by two- and three-man crews and the foliage samples brought to the Lakeview Ranger Station warehouse by motor vehicle for examination by a crew of six women. Foliage samples from plots in Washington and Oregon were collected by Region 6 Insect and Disease Control personnel. Foliage samples from plots in northern California were collected jointly by Region 5 and Region 6 Insect and Disease Control personnel.

The 1963 evaluation survey required 190 man-days of work: 39 man-days collecting foliage; 144 man-days examining foliage; and 7 man-days separating new and old egg masses and summarizing data. This year's survey required 69 man-days more than last year's survey. The reason for the increased amount of time required this year is twofold. Eleven more plots were sampled in 1963 than in 1962. Secondly, four of the six foliage examiners had no previous experience, while all four of the 1962 examiners had at least one year's experience.

Evaluation

Results of the 1963 spruce budworm egg mass evaluation survey show that budworm populations in the 23 forested areas sampled in Washington and Oregon will be at very low levels in 1964 (table 2). Budworm population trends will be significantly downward at 18 of the 23 areas sampled and static at the remaining five. No increase in population is expected at any of these areas in 1964. Estimated plot tree defoliation ranged from none to severe in 1963 but is expected to be very light or nonexistent in 1964 at all areas sampled. No control for spruce budworm will be necessary in Oregon and Washington in 1964. Spruce budworm conditions by geographical area are:

^{3/} Buffam, P. E. Evaluation of 1961-62 Spruce Budworm Populations in Oregon and Washington. U.S. Forest Service, Region 6. 4 pp. (Processed.) October 24, 1961.

Table 2.--Spruce budworm egg mass density, defoliation intensity, and predicted trendsat 23 sampling points in Washington and Oregon

Administrative unit	Plot	:New egg masses per:		Estimated average defoliation		:		Predicted 1963-64 populations	
		:1000 square in. of:		of new shoots		:			
		: foliage examined :		1963		1962			
		: 1963 : 1962 :		:		:			
		Number		Pct.	Level ^{1/}	Pct.	Level ^{1/}	Level ^{1/}	Trend
Kaniksu N. F., Washington	Bear Paw Ridge	0.1 ^{2/}	1.7 ^{3/}	10	Very light	--	--	Very low	Down
	North Fork Goose Cr.	0.7	2.0 ^{3/}	100	Severe	--	--	Very low	Static
Wallowa-Whitman N. F., Ore. Wallowa Mountains	Mormon Trail	0.3 ^{2/}	11.6	10	Very light	--	--	Very low	Down
	Hat Point #2	0.0	0.1 ^{4/}	0	None	--	--	None	Static
	Hat Point #4	0.2 ^{2/}	6.4 ^{4/}	1	Very light	--	--	Very low	Down
Simcoe Butte, Washington	Simcoe Butte #1	0.0 ^{2/}	0.5 ^{4/}	0	None	--	--	None	Down
	Simcoe Butte #2	0.0 ^{2/}	2.2 ^{4/}	0	None	--	--	None	Down
	Simcoe Butte #3	0.0 ^{2/}	3.4 ^{4/}	0	None	--	--	None	Down
	Simcoe Butte #4	0.0 ^{2/}	1.4 ^{4/}	0	None	--	--	None	Down
	Simcoe Butte #5	0.0 ^{2/}	0.3 ^{4/}	0	None	--	--	None	Down
	Simcoe Butte #6	0.0 ^{2/}	0.7 ^{4/}	0	None	--	--	None	Down
	Simcoe Butte #7	0.0	0.3	0	None	1	Very light	None	Static
Fremont N. F., Oregon Warner Mountains	Summit Prairie	1.0 ^{2/}	11.7	100	Severe	50	Moderate	Very low	Down
	Rogger Peak	0.2 ^{2/}	2.9	30	Moderate	10	Very light	Very low	Down
	Kelley Creek	0.6 ^{2/}	1.6	30	Moderate	30	Moderate	Very low	Down
	Drake Springs	0.2 ^{2/}	4.2	100	Severe	30	Moderate	Very low	Down
	Squaw Butte	0.1	16.7	100	Severe	80	Severe	Very low	Down
Gearhart Mountain	Picture Flat	0.0	0.2	1	Very light	1	Very light	None	Static
	Patton Meadow	0.3 ^{2/}	8.5	90	Heavy	60	Heavy	Very low	Down
	Pothole Creek	2.3 ^{2/}	14.2	90	Heavy	50	Moderate	Very low	Down
	Mitten Springs	0.6	1.7	30	Moderate	1	Very light	Very low	Static
	Ryan Cabin	2.3 ^{2/}	4.7	20	Light	90	Severe	Very low	Down
	Taylor Buttes	0.7 ^{2/}	1.9 ^{3/}	50	Moderate	--	--	Very low	Down

^{1/} Carolin, V. M. and W. K. Coulter. Research findings relative to the biological evaluation of spruce budworm infestations in Oregon. U. S. Forest Serv., Pac. N. W. Forest and Range Expt. Sta. 39 pp. (Processed) Dec. 14, 1959.

^{2/} Significant at $p = .10$.

^{3/} Plot was established in 1963. Egg density for 1962 was estimated from "old" egg masses recovered during the 1963 survey.

^{4/} Plot was not sampled in 1962. Egg density for 1962 was estimated from "old" egg masses recovered during the 1963 survey.

Northeastern Washington - The new outbreak on the Kaniksu National Forest will continue at a very low level in 1964. Some very light defoliation may occur.

South Central Washington - Budworm populations on the area sprayed with DDT at the rate of 1 pound per acre in 1962 are extremely low. Only one egg mass was found during the examination of foliage from seven plots. No defoliation was observed in 1963 either from the ground or the air. The result of the 1963 budworm egg mass evaluation survey at Simcoe Butte is further assurance that the 1962 cooperative spray project was highly successful.

Northeastern Oregon - Although budworm-infested acreage on the Wallowa-Whitman National Forest increased in 1963, budworm populations are expected to drop to very low levels in 1964. Tree damage on the sample plots was predicted to be heavy in 1963 as a result of last year's egg mass survey, but only light damage was inflicted. The reason for this reduction is not known, but adverse weather conditions are suspected. Only very light defoliation should occur on or near the sample plots in 1964.

South Central Oregon - Results from all plots sampled in the Warner Mountains on the Fremont National Forest indicate a definite downward trend for spruce budworm populations and tree damage in 1964. Data from four of six plots sampled near Gearhart Mountain on the Fremont National Forest show a definite downward budworm population trend; but budworm population and damage levels on the two remaining plots will be static. Spruce budworm population and tree damage levels will be very low and very light, respectively, in 1964 for all areas sampled on the Fremont National Forest in 1963.

